

The Overhauling Educational Market and Reformation of Supplementary School Market in China

Stock Analysis, Impact Suggestions, and Future Trend Indications

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ABSTRACT

This article focuses on the impact of the newly enacted policy document, *Guidelines to Ease the Burden of Excessive Homework and Off-campus Tutoring for Students Undergoing Compulsory Education* on supplementary education, which marks the clampdown of the profit-driven education sector. The analysis concludes that as a Black Swan incident, the 2021 *Burden Alleviation Policy* results in considerable negative impacts on the stocks of major supplementary education suppliers, resulting in a 9% decline in sales in the industry. This challenging circumstance pushes existing firms to transform their services: (a) from academic to interest-related, (b) from student-oriented to career-oriented, and (c) from offline to online. Meanwhile, the government administration should follow the strategy of “demand dispersion over jural prohibition”. It ought to reinforce the regulatory system, to increase investment on public services, and, if necessary, to mitigate the passive social impacts brought by supplementary education.

Keywords: *Supplementary Education, K12 Education, 2021 Burden Alleviation Policy*

1. INTRODUCTION

The supplementary education sector in China has thrived greatly during the past two decades. The definition of supplementary education sector comes from the concept of the three education sectors: the public school sector, the private school sector, and the supplementary school sector. It provides fee-based tutoring of supplementary instructional services to students in their academic subjects and interest courses involved in the former two sectors, but it is not included in the national education system. Supplementary education organizations in China have extended their scopes of business much wider. Some typical representative institutions include the New Oriental Education & Technology Group and TAL Education Group, which are the largest companies in the industry in not only China but also in the world. Many parents believe that such organizations increase the peer pressure of students.

On July 24th 2021, the General Office of the Central Committee of China's Communist Party and the

General Office of the State Council jointly released the *Guidelines to Ease the Burden of Excessive Homework and Off-campus Tutoring for Students Undergoing Compulsory Education* (abbreviated as 2021 Burden Alleviation Policy hereafter) [1]. It responds to the increase in peer pressure caused by ‘off-campus training’ provided by the supplementary education sector, and the consequently created education inequality. The rising costs of attending supplementary education is considered to create education unfairness between households with lower income and those with higher income.

The supplementary education sector in China may face a cold winter with the new-coming regulations on the market. Considering its, there will be a noticeable shock to the stock market as the education industry becomes a bear market. In this article, the impact of the “overhauling educational market” policy on the stocks of the supplementary sector will be analyzed, and some possible indications of future trends will be investigated. There will be suggestions regarding the transformation of firms’ services for relevant institutions based on

statistical analysis. Several government strategies will be proposed to alleviate the passive impacts brought by the intensification of supplementary education.

Liu concerns about the passive social influences that supplementary education has on its participants, it is discovered that such type of education not only places heavy burdens on students but may also result in a subsequent backwash effect on regular schooling. Beyond that, anxieties will be experienced by both parents and students, unequal accessibility of private tutoring causes social inequality and families have to bear a heavy financial burden to afford the extra education. Liu's investigation in The Nationwide Special Inspection in 2018 found that 259,000 out of the 382,000 institutions inspected are unqualified with universal misconducts. Liu concludes by proposing suggestions to educate consumers and propose a self-regulation mechanism to compensate for the existing issues [2].

Liu claims that parents play a significant role in deciding their future in China in the consideration for the future development of children. Parents' social and economic position, their aspiration for their kids to get advanced education, and their limited time of teaching their children contribute to the increasing demand for private tutoring. The tutoring sector, therefore, has become a standard component of recent education in China for primary school and secondary school [3].

Huang and Wei reported, based on the China Institute for Educational Finance Research – Household Survey 2017 (abbreviated as CIEFR-HS 2017 hereafter), that the overall participation rate in supplementary education among K12 students is 48.3% in 2017 while the average annual expenditure of students participating is 5,616 yuan. The overall scale of the Chinese supplementary education industry is estimated to reach 490 billion yuan, where 30% of the services are rendered by commercial firms. Huang and Wei have discovered that the participation rate of supplementary education increases with an increase in the economic strength of households, this will eventually lead to an imbalance in the availability of quality education. The solution proposed by Huang and Wei is to provide free academic support for those at an economic disadvantage [4].

Ouyang discovers that the orientation of the supplementary education industry is transforming from compensating academically poor students to providing advanced tutoring to excellently performing ones. The operation of private tutoring is becoming increasingly institutionalized and standardized. However, the increasing intensification of supplementary education is a prisoner's dilemma, where the Nash equilibrium is distinct from the optimal solution. Ouyang suggests three possible trends for the transformation of supplementary education in the future: increasing

conglomerated structure, further integration of technology into services, and institutionalizing target audiences. Among the three, technology is the key component towards success as it not only ensures management efficiency but also provides new possibilities for the extension of services [5].

Liu analyzes some key driving forces of intensive demand towards academic tutoring services, this includes: (a) to increase competitiveness in the college entrance system, (b) to compensate the defaults of in-school education, (c) to seek for higher quality services, (d) to participate academic contest, (e) to be prepared for studying abroad and (f) peer pressuring effect. He also investigates the driving force of demand towards interest-oriented courses to be (a) to promote all-round development of students, (b) to increase the overall competitiveness, (c) to improve students' physical strength, (d) to provide a solution for after-school trusteeship for parents and (e) peer pressuring effect [6].

On the governmental response to the supplementary education market, Pan concludes that the long-lasting demand and intensive capitalization in supplementary education make the market ineradicable. Therefore, elimination policies are not appreciated. The supplementary education market should be incorporated into the government supervision system, and the standard of operation needs to be issued. Meanwhile, improvements in the supply of quality education are essential to disperse the demand from private tutoring. The government should educate the consumers to reduce the societal stress on the compulsory education system [7].

Park et al. focus on the factors triggering intensification of supplementary education and discover that higher demand for supplementary academic activities is most evident in countries where students are evaluated with their test scores, thereby, it's arguable that the demand for supplementary education usually derives from the poor quality of public school education. Park, Buchmann, Choi, and Merry list out that income inequality and globalization are the macroeconomic factors that drive the demand for supplementary education. Ultimately, they conclude that though the existence of supplementary education brings some noticeable negative social outcomes, it does bring some benefits for those disadvantaged students with respect to the richer ones as it is a way to compensate for the difference between private and public education, despite with uncertainties [8].

2. METHODOLOGY

To evaluate the impact of the 2021 Burden Alleviation Policy on the Chinese supplementary education market, this article will provide a statistical analysis both microcosmically and macrocosmically on

that segment of the market. The analysis will monitor the performance of the major providers of supplementary tuition services in the US stock market with respect to an index fund, Bosera Funds on Global Chinese Education, thereby offering an objective viewing of the stock market response to this Black Swan event in a given period from June 16, 2021, to August 31, 2021. (2) The macro-level analysis will discuss the changes observed on the leading indicators of the market before and after the release of the policy and eventually render some key trends followed by the market under the current circumstance, leaving a reasonable prediction on the future market developments.

2.1. Data Preparation

The stock market data of the 7 individual listed firms referred by this article are extracted from Yahoo! Finance [9]. Table 1 lists the name and codes of the firms.

Table 1. The 7 listed Chinese educational firms that will be analyzed in the article

Name of the company	Index
Gaotu Techedu Inc.	GOTU
New Oriental Education & Technology Group Inc.	EDU
TAL Education Group	TAL
Zhangmen Education Inc.	ZME
Youdao, Inc.	DAO
17 Education & Technology Group Inc.	YQ
China Online Education Group (51 Talk)	COE

The article will introduce an index, the Bosera Funds on Global Chinese Education (abbreviated as Bosera Index hereafter), to represent the overall performances of Chinese educational firms as an entirety [10].

2.2. Statistical Equations

The indicators derived from the following formulae will evaluate the market condition in multi-aspect, thereby providing a foundation for the comparison regarding the market before and after the release of the policy.

2.2.1. Pricing Data

The article will employ the adjusted close price as the pricing data for individual stocks. The index will be assessed by the Net Asset Value, or NAV, which is a numerical representation of the market value of the fund.

2.2.2. Returns

The article calculates the returns of the stocks and the index on a daily basis, in which daily return is calculated as the percentage change in the price of the security in the day to the previous day’s adjusted close price.

$$\text{Daily Return} = \frac{\text{Stock price in Day}_1}{\text{Stock price in Day}_2} - 1 \tag{1}$$

2.2.3. Standard Deviations

Standard deviation determines the dispersion of a dataset with the relation to its mean value. It is a valuation of the level of uncertainty, or risk level, of an individual stock. In a sample, the standard deviation is noted as:

$$\text{Sample Standard Deviation} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} \tag{2}$$

In the above expression, n denotes the size of the sample, x_i denotes the i^{th} stock price, \bar{x} denotes the sample mean and $n - 1$ denotes the adjustment for the elimination of bias.

2.2.4. Sharpe Ratio

The reward-to-volatility ratio or the Sharpe ratio measures the risk premium per unit risk. Hereby it is a measurement of the performance of a stock, where a higher ratio denotes better performances.

$$\text{Sharpe Ratio} = \frac{\text{Risk Premium}}{\text{Standard Deviation of excess return}} \tag{3}$$

2.3. Correlations

Correlation is a statistical measurement of the degree of the linear relationship between 2 individual stocks, and it is ranged from -1 to +1, where -1 denotes perfectly negative correlation and +1 denotes perfectly positive correlation.

$$r = \frac{\sum_{i=1}^n ((x_i - \bar{x})(y_i - \bar{y}))}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2 \sum_{i=1}^n (y_i - \bar{y})^2}} \tag{4}$$

Hereby n represents sample size, x_i represents the i^{th} stock price for stock x , \bar{x} measures the sample mean of stock x ; similarly, y_i represents the i^{th} stock price for stock y , \bar{y} measures the sample mean of stock y .

2.4. Data sources

The article will utilize data extracted from market analysis conducted in 2017 and 2021 respectively enable a valid comparison. Specifically, the 2017 data is available from the market research known as *CIEFR-HS*

2017 conducted by Peking University. The market research of 2021, on the other hand, will be derived from various sources including MOE (Ministry of Education of China) and multiple specialized research institutes. The high reliability of the sources of data ensures the high reference value of the conclusions reached by the article.

2.5. Demand-side analysis

Analysis on demand-side information will be mainly targeting the participation rate of K12 students in supplementary education as well as the average expenditure in supplementary education. There will be separate focuses on academic tutoring and interest-oriented courses presented in the results section.

2.6. Supply-side Analysis

The article will render specific information concerning the type of suppliers and the type of supply (method of teaching) that the market offers, and their respective participation rate among K12 students. The results will be shown in tabular forms for more straightforward comparisons to be drawn.

3. RESULTS

This section renders a visual presentation of the processed data using the aforementioned statistical measures. There will be independent focuses on both the stock market and the supplementary education market as an entirety. From the conduct of stock market analysis, the article concludes 4 key trends followed by the market in responding to the policy. (a) The average daily prices of all the firms listed experienced downward shifts, but to different extents. Firms initiating with a relatively high price per share

encounter a greater depreciation than those initiating with relatively low price per share. Thereby the average return of each stock, based on the provided price fluctuations, also trends downwards. (b) The standard deviation of daily prices of the firms in the given period all exaggerates, indicating a greater risk level is observed in the stocks. (c) During the period, changes in the nominal risk-free rate are neglectable, the fluctuation (represented by standard deviation) maintaining as low as 0.10% [11], this suggests that the external macroeconomic variants are under control. (d) With an average decrease in the return of the stock and a simultaneous incline in the standard deviation, the Sharpe ratio declines for the listed stocks, indicating a lower reward per variability (risk) taken. On the other hand, changes in the supplementary education market correspond to the trends observed in the stock market. (a) The overall supplementary market shrinks in scale, particularly in academic tutoring markets. (b) There’s a growing interest in quality education, which is represented by the growing demand for interest-oriented courses. (c) The role of private commercial institutions has diminished and been replaced by governmental services. (d) With the development of technology, the online industry is becoming increasingly demanding.

3.1. The Correlation Matrix

The Correlation Matrix is presented below in Table 2. The mean correlation remains at 0.755, which suggests a strongly proportional relation between different stocks. The highly positive correlation establishes a foundation for the universal applicability of the later derived conclusion on the different individual stocks.

Table 2. The correlation matrix showing the correlation between every 2 stocks in the selected 7 stocks

	Bosera Index	GOTU	EDU	TAL	ZME	DAO	YQ	COE
Bosera Index	1	0.802	0.859	0.870	0.683	0.826	0.796	0.784
GOTU	0.802	1	0.890	0.916	0.683	0.787	0.836	0.827
EDU	0.859	0.890	1	0.922	0.665	0.752	0.867	0.840
TAL	0.870	0.916	0.922	1	0.665	0.746	0.877	0.830
ZME	0.683	0.683	0.665	0.665	1	0.746	0.623	0.713
DAO	0.826	0.787	0.752	0.746	0.746	1	0.735	0.812
YQ	0.796	0.836	0.867	0.877	0.623	0.735	1	0.840
COE	0.784	0.827	0.840	0.830	0.713	0.812	0.840	1

3.2. Daily Pricing Data

The release of the 2021 Burden Alleviation Policy leads to an immediate and dramatic drop in the daily price of listed 7 firms. Figure 1 displays the daily price

of the 7 selected stocks as continuous data in an integrated linear graph. There’s an agreed dramatic drop in the share price on July 23, 2021, despite with different magnitude, this corresponds with the date that the policy is released. With an average decline of

40.6%, the scale of the market shrinks significantly on a single day. The Bosera Index also experiences an

evident decline in its NAV, indicating the overall negative impact produced by the policy on the market.

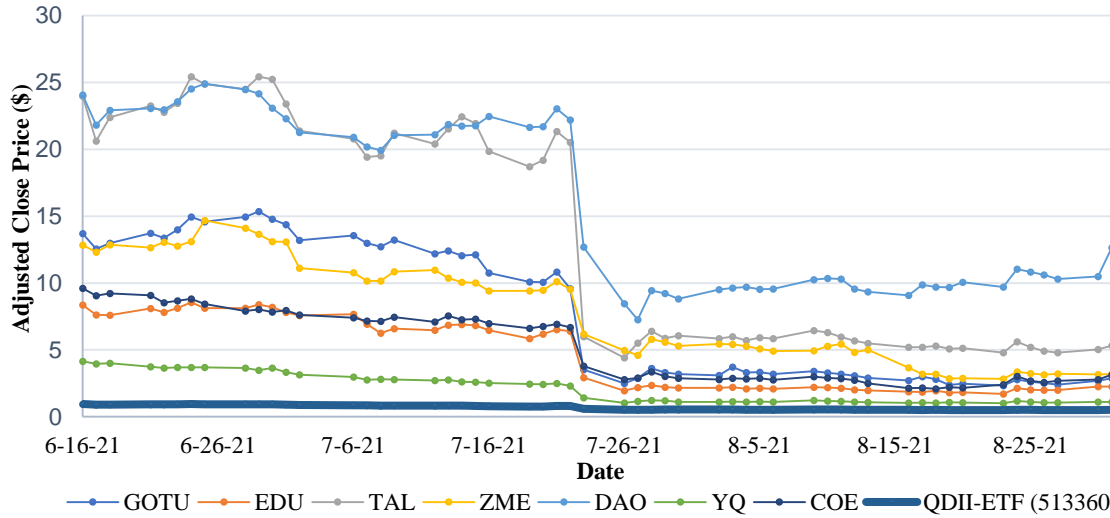


Figure 1. Lines display the average daily price (adopting the adjusted closing price) of 7 selected stocks with Bosera index (represented by “QDII-ETF (513360)” which is its stock code)

3.3. Daily Returns

Figure 2 presents the daily returns of different individual stocks among the 7 listed firms and several trends can be summarized. (a) An average of almost 0% return is gained before the release of the policy. (b) The announcement of the policy created a drastic drop in the return level, despite the magnitude varies for different

stocks. (c) The return of the stocks quickly rebounds back to the original level of 0%, leaving a “valley” shape across the period. This deeply correspond to the daily prices presented in figure 1, where the stock prices remain relatively stable before (before July 22nd, 2021) and after the release (after July 28th, 2021) of the policy.

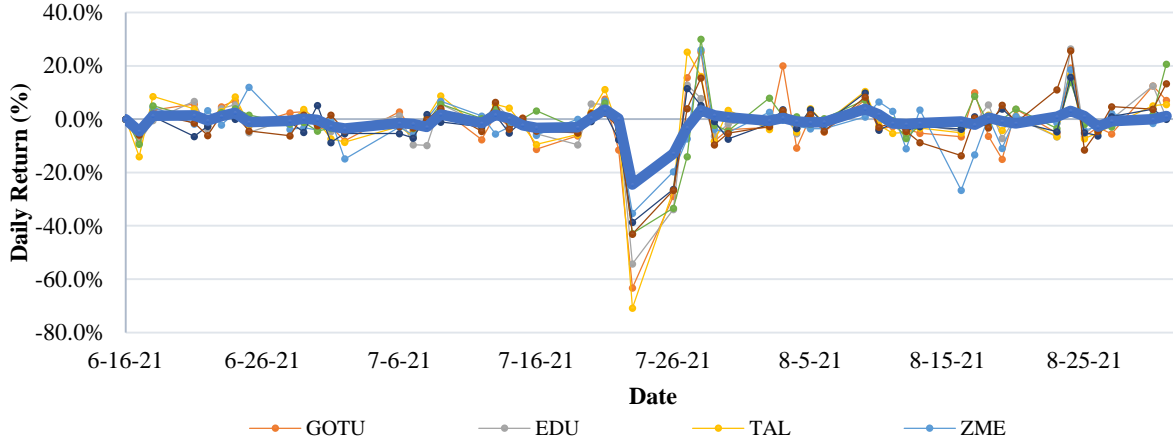


Figure 2. Lines displays the daily return of the 7 selected stocks with index

3.4. Standard Deviation

The relevant results regarding the standard deviation are presented in figure 3, where the high standard deviation level classifies the stocks as high-risk assets. The standard deviation for the Bosera index represents the lowest daily level among all stocks, but still

maintaining as high as 4.145%. High volatility level in the general market raises the consumers’ expectations of uncertainties, hence it discourages those marginal investors who are more risk-averse to disinvest from the market. This partially explains the decline in the overall scale of the supplementary education market in China followed by the introduction of the policy.

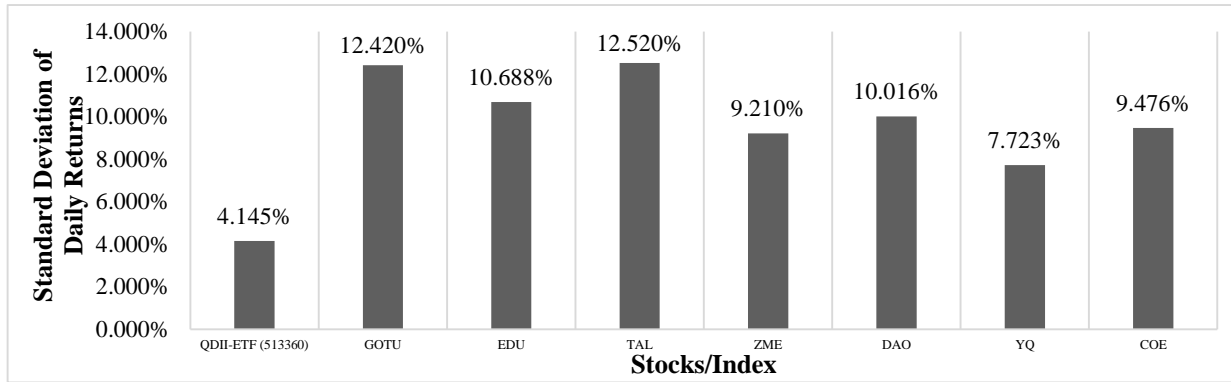


Figure 3. Bar graph displays the standard deviation of daily returns of 7 selected stocks with index

3.5. Sharpe ratio

Presented in figure 4 is the Sharpe ratio of the 7 selected stocks with respect to the Bosera index. The average Sharpe ratio maintains at a level of 0.273 which is much lower than 1, suggesting that the investors

cannot get fully compensated with return for every unit of risk taken, hence classify the stocks as low-performance assets. This echoed with the almost 0% return level alongside a high standard deviation level presented in figure 2 and 3, and it is a demonstration of an unoptimistic market overview.

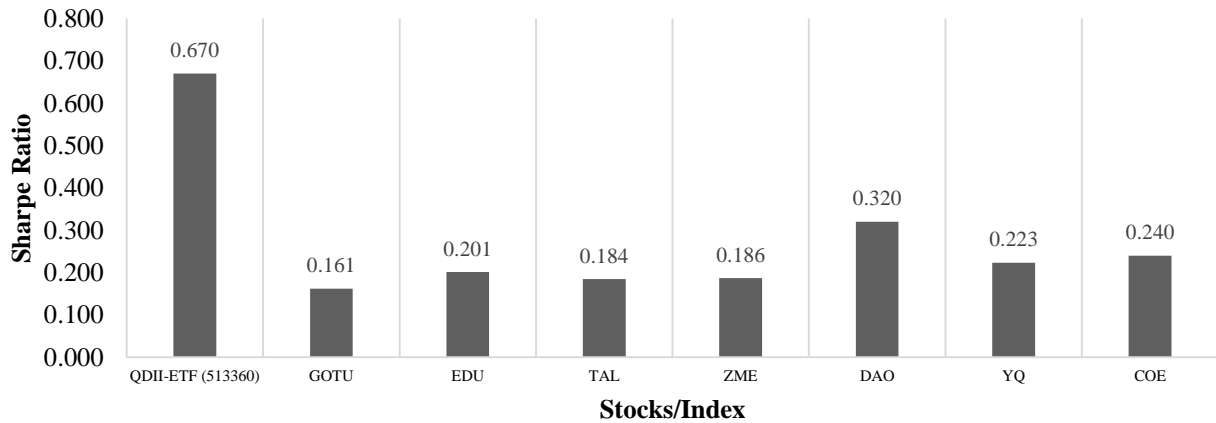


Figure 4. Bars displays the Sharpe ratio of the 7 selected stocks with index

3.6. Data Comparison

To provide a more explicit comparison of the market condition before and after the release of the policy,

Table 3 summarizes the key indicators for measuring the performance of the supplementary education market before and after the implementation of the 2021 Burden Alleviation Policy.

Table 3. Table summarizing the key information of the 7 selected stocks before and after July 23rd, 2021

	Index	GOTU	EDU	TAL	ZME	DAO	YQ	COE
<u>From June 16th, 2021 to July 23rd, 2021</u>								
Average Daily Prices	0.872	12.885	7.318	22.056	11.562	22.408	3.155	7.810
Average Daily Returns	-0.6%	-1.3%	-0.9%	-0.4%	-1.0%	-0.3%	-2.3%	-1.4%
STD of Daily Returns	2.1%	5.5%	5.3%	6.4%	5.4%	3.7%	3.6%	3.5%
Sharpe Ratio	1.494	0.487	0.528	0.520	0.511	0.947	0.444	0.671
<u>From July 23rd, 2021 to August 31st, 2021</u>								
Average Daily Prices	0.525	2.969	2.098	5.535	4.356	9.915	1.123	2.748
Average Daily Returns	-1.4%	-2.3%	-2.4%	-2.5%	-3.1%	-1.0%	-2.0%	-1.7%
STD of Daily Returns	5.4%	16.6%	14.1%	16.4%	11.8%	13.6%	10.3%	12.8%
Sharpe Ratio	0.455	0.095	0.110	0.085	0.069	0.218	0.187	0.170

The stock prices of individual firms have decreased by 63.8% on average. A general decrease in the stock price is predictable as the 2021 Burden Alleviation Policy stipulated all of the existing suppliers of supplementary education to be registered as non-profit institutions [12], suggesting that firms are no longer profit-oriented. Consecutively, demand for stocks declines drastically, which indicates the collapse of the investors' confidence in the industry. This is reflected straightforwardly by a crash in price.

The return levels of individual firms have decreased by 167.6% on average. The decline in the return level is a signal of poor performances of the individual firms in the market. The negative fluctuation of return over 100% is a clear indication of a bear market, demonstrating the spread of pessimism in the industry.

The standard deviations of stock prices of individual firms have increased by 189.9% on average. A substantial increase in standard deviation represents a high-risk level, and hence high uncertainties within the market. This encourages those investors who are more risk-averse to disinvest from the market.

The Sharpe ratios of individual firms have decreased by 76.1% on average. This is expected due to a general decrease in the return level and a concomitant increase in standard deviation. Despite the Sharpe ratio of the stocks are already maintaining a level less than 1 which marks non-optimal performances, the release of the 2021 Burden Alleviation Policy brings that value down to almost zero, indicating that the market has responded very negatively to the policy.

The relevant information is presented in table 4. The results regarding demand and supply aspects will be discussed separately as the following.

3.7. Demand-side information

Regarding the demand perspective, as the 2021 Burden Alleviation Policy goes into effect, the average demand for supplementary education has been diminishing. The overall participation rate of K12 students in supplementary education has declined from almost 50% in 2017 to only 17% in 2021. The decrease

in the demand could be partially explained by the regulative policy, in the meantime, government measures of "demand dispersion" have also played a significant role. As expected, the overall scale of supplementary education decreases by 53 billion yuan. Reduction in the participation rate in academic tutoring is the major contributor to this downward trending demand, where it is estimated that only less than half of the proportion of students in 2017 are participating in such tutoring by 2021.

While the academic tutoring market is shrinking in scale, the increasing focus on quality education expands the scale of the interest-oriented market from 140 billion to 159 billion yuan across 4 years. More students are participating in interest-oriented courses, which follows the governmental appeal for the all-round development of students.

3.8. Supply-side Information

From the supply perspective, it is easily seen that the market share of commercial firms has decreased dramatically from 40% to a range between 10% and 20%. This marks the diminishing influence of private institutions in the supplementary education market. This corresponds with the report produced by the MOE, where it states that 85% of the students in public school have participated in after-school programs provided by the government. The government's establishment of the after-school program makes it a competitive substitute due to its high-quality services and low prices, thereby appeals to a considerable proportion of the student population. This makes it justifiable to witness a decline in the role of private institutions in the market.

Apart from that, supplementary education is trending towards providing online services rather than offline ones. The increase in the scale of the online industry from 72.2 billion yuan in 2017 to 126 billion yuan in 2021 suggests more investments are allocated to the online industry. As an opportunity cost, the scale of the offline industry has declined by 125 billion yuan in the 4 years. This leading inclination towards online services marks a proceeding transformation of the firms in responding to the 2021 Burden Alleviation Policy.

Table 4. Chinese supplementary education market before and after the implementation of 2021 Burden Alleviation Policy (where "*" denotes estimation as no data is available)

Market Overview	2017	2021
<u>Demand Side Information</u>		
Overall percentage of K12 student attending 1+ supplementary education service	48%	15-20% [13]
Percentage of K12 students attending out-school academic tutoring	37.8%	15.0%*
Percentage of K12 students attending out-school interest-oriented courses	21.7%	25.0%*
Average annual expenditure distributed to all K12 students (yuan)	2,697	3,000*

Overall scale of K12 supplementary education market (yuan)	614 billion	561 billion [13]
Overall scale of K12 out-school academic tutoring market (yuan)	360 billion	400 billion*
Overall scale of K12 out-school interest-oriented courses market (yuan)	140 billion	159 billion [13]
<u>Supply Side Information</u>		
Scale of K12 supplementary education provided by commercial firms as a percentage of the overall scale of K12 supplementary education market	40%	10-20%*
Percentage of K12 students (attended in supplementary education) participating offline class courses	87.0%	71.0% [14]
Scale of K12 offline supplementary education market (yuan)	550 billion	435 billion [14]
Percentage of K12 students (attended in supplementary education) participating online courses	13.0%	29.0% [15]
Scale of K12 online supplementary education market (yuan)	72.2 billion	126 billion [15]

4. DISCUSSION

This section will integrate the result from the conducted calculations as well as the findings from the previous literature to analyze the key determinants driving the demand for supplementary education and the intentions of the policy, thereby providing an insightful interpretation of the supply-side responses to changes in the market. Specifically, several suggestions regarding the possible transformations of the supplementary education suppliers will be discussed in this section. On a macro level, the interpretation of governmental intentions through the 2021 Burden Alleviation Policy renders a foundation for the later recommendations of government measures consecutive to that policy, which possesses a high reference value for later investigations.

4.1. The Demand for Supplementary Education

Consistent demand for supplementary education is always concerned as the key driving force for the rapid development of the market. Some major determinants of demand are discussed below.

4.1.1. Increasing the Competitiveness of students in Enrolment

The initiative demand for supplementary education originates from the parents' expectation to increase their children's competitiveness in school enrolment. Such a phenomenon represents the eagerness of the parents in providing their children with the best resources available, which results in the consolidation of the supplementary education market.

4.1.2. Compensating for the Disadvantages of School Education

The burden alleviation policies have been long established on a national level since 1955 but have contributed negatively to the original purposes of

burden easement [16]. Increasing governmental regulation in compulsory education does reduce students' workload in and after-school, but these policy measures do not correspond with the reformation of the educational resource distribution mechanism among students [17]. The conflict between equity and equality further intensifies the parents' concerns regarding the quality of compulsory education, therefore they demand supplementary education to compensate in-school deficits and to outstand their children from greater competition brought by equity.

4.1.3. Peer Pressure Effect

The peer pressure effect is a social phenomenon that only occurs when the market of supplementary education has already grown to a considerable scale [6]. The increasing acceptance of supplementary education services among the students has deepened and widened the knowledge requirement towards students, thereby creating a situation of "involution". Under the given context, involution refers to the circumstance whereby an increasing level of overall student efforts leads to no change in overall gain due to the finite and non-expanding nature of opportunities for higher education. The ultimate resolution of the peer pressure effect results in a prisoner's dilemma, which marks a Pareto inefficiency. Being trapped in such a dilemma, participation in supplementary education becomes an irrational yet necessary decision to be made by students and parents.

4.2. Possible Transformations of the Supplementary Education Suppliers

The jural prohibition of the provision of academic tutoring services is intended for the supervision department to intervene in the market via the supply side, which makes the financial situation of targeted firms tenuous. Specifically, the new regulation requires the existing institutions to be registered as non-profit-

oriented and disallows public financing for the listed firms. Results drawn from Table 4 have already shown a declining growth of the scale of the supplementary education market, the enactment of this restrictive policy will further disintegrate the existing capital accumulated. To accommodate the dramatic changes brought by this Black Swan incident, the existing firms should respond actively by transformations, including re-management of product lines and re-adjustment of marketing strategies. This section will render 3 possible transformations of supplementary education firms, thereby providing an insight into the future developing trends of the market.

4.2.1. Transformation from Academic to Interest-related

It has been a deeply rooted convention for the colleges in China to evaluate the students purely on their academic performances, this results in consistent demand for high-quality education, the demand is then later transformed into a demand for supplementary education as it provides a relatively equitable platform of resources. As the 2021 Burden Alleviation Policy goes into effect, the supply of academic-oriented out-school courses is strictly limited, this is coordinated with the dramatic decline in the participation rate in academic tutoring among K12 students presented in table 4. Meanwhile, the increase in the participation rate in interest-oriented courses indicates a shift in the focus of the supplementary education market from academics to interest-oriented, which deeply corresponds to the governmental appeal for the all-round development of students [18]. With the current market transformation followed by policy appeal, it's highly possible that the quality education market will become the next blue ocean market in the predictable future. Services regarding quality education have been traditionally provided by individual suppliers, leaving a gap for the entry of a large integrated intuition to provide systematic training and supports [19]. The lack of effective competition as well as the low barrier to entry makes the transformation of firms' services from academic tutoring to quality education highly feasible to realize.

4.2.2. Transformation from student-oriented to career-oriented

Relative to the population of students, China has a much larger working population consisting of 776.4 million workers [20]. A larger population basis makes the demand for job training services more consistent and stable compared to the supplementary education market. Beyond that, fewer governmental interventions are seen in the career training market, hence lower uncertainties are expected. Previous literature conducted by Ouyang has shown the multiple advantages of institutionalized

and standardized operation in supplementary education market, particularly, standardization of supply of the services enables the devotion of high-quality services, which constructs consistent demand for the services, and thereby it guarantees high rewards for the suppliers. Similar management strategies are also applicable in the career training market. On top of that, despite the already existence of specialized institutions in the market, none of them are comparable in the scale of capital accumulation with the listed firms above, which further reduces the barrier to entry and makes the transformation more feasible to occur.

4.2.3. Transformation from offline to online

As the online platform services have grown to become increasingly matured and popular, it provides another possible alternative for the transformation of the existing supplementary education services. Market research presented in Table 4 has shown an increasing interest in the online courses, in which the growing scale and participation of the online supplementary education industry represents an optimistic market prospect of the industry. Apart from that, the policy message also increases the feasibility of such transformation as monitoring on online platforms is relatively loosened.

Taking the advantage of a well-maintained infrastructure system, China achieved an internet access ratio of 71.6%, which covers a netizen population of 1.011 billion [21]. The general coverage of the internet network facility establishes a large base of potential consumers; hence it not only represents a structural transformation of the services from offline to online, but it also provides a possibility for the extension of its services to a larger user community. In particular, extensions to rural markets are made probable, leaving a considerable potentiality to be explored.

With the consideration of cost aspects, online supplementary education can be provided at a much lower marginal cost than that of the offline method. Operation on the online platform does not require the usage of physical resources including classroom sites and transportation needs, which makes it more cost-competitive to offline services, and this is a significant advantage especially for institutions with insufficient financing. The promotion of technological advancement, for instance, the development of 5G and Artificial Intelligence, makes more interactions among participants available, which guarantees the quality of the services rendered.

4.3. Possible government responses consecutive to 2021 Burden Alleviation Policy

The discussion in section 4.1 outlines the determinants of the consistent demand for

supplementary education and concludes that it's almost impossible to fully eliminate the industry by issuing jural prohibition on the supply aspect. On one hand, the existing college-entrance system has led to a non-demanding situation, namely the academic involution, which disordered the behaviours of individual students and parents involved towards an irrational aspect and eventually results in a non-optimal outcome. On the other, fundamental reformation concerning the college-entrance system is not feasible in the predictable future, thereby pushing the government into a dilemma.

Before rendering suggestions regarding further government responses to the market, constructing a comprehension interpretation of government intention is vital for outlining the areas of reformation. Though it is undeniable that the 2021 Burden Alleviation Policy did cause unpredictable reformations of the K12 supplementary education market in China, it remains inappropriate to interpret the government's comprehension as to restrict or even forbid the development of supplementary education. A relatively reasonable justification of government objective is that the government is attempting to eliminate or at least minimize the passive impacts of supplementary education as well as to provide a specification of capital management in the industry. Ultimately, the purpose corresponds with the macroeconomic aim of government demanding equity in resource distribution.

Aiming to provide a resolution to the ongoing dilemma, this article recommends the MOE to follow the administrative ideology of "demand dispersion over jural restrictions", typically, the supervision department should attempt to intervene in the market from both the demand and supply perspectives to effectively adjust the market development in the future.

4.3.1. Reinforcing the Regulatory System in the Supplementary Education Market

Since it has been proven that the supplementary education industry is non-removable, the government should alternatively consider accepting the industry with the enforcement of new regulations. Similar practices have been enacted in the South Korean supplementary education market. The publication of the document *Suggestions to Increase the Competitiveness of Public School to Reduce Shadow Education* by the South Korean government approves the legal existence of supplementary education providers in the market, in the meantime, specialized administrative departments are set up to monitor the development of the market. It has been proven by the conducts in South Korea that the government policies are only operative with the establishment of a comprehensive monitoring system [22]. Specifically, the government has to be acknowledged of both the demand and supply side

information of the market to implement policies to adjust the market failures and disequilibrium.

Despite the experiences from the South Korean market that did provide some guidelines for the policy review in the Chinese market, these are not totally applicable due to the differentiating market scale among the two countries. By 2021, the overall scale of the Chinese supplementary education market has reached 561 billion yuan, thereby in order to discourage a further accumulation of capital in the market, the government should immediately increase the barrier of entry. It is commendatory for the government to raise the requirement of qualification of institutions as such methods could effectively exaggerate the complexity of the application procedure, thereby increases the opportunity cost of entering the market. Beyond that, there ought to be more frequent examinations of the developing condition of the institutions in the market. The Nationwide Special Inspection in 2018 is a typical example of the conduct, as it provides a general database to reflect the current circumstance for the government, enabling further interventions if needed.

There exists the academic involution that eventually triggers the consistent demand for supplementary education. To resolve this dilemma situation, advertisement is the first and foremost campaign to be restricted as advertisement plays a major role in creating and enhancing societal stress, hence it further raises parental anxiety in the current intensified academic competition. With the provided problem, the institution then introduces its services as a necessary solution and guides the parents and students to participate in supplementary education. To solve the issue from its fundamentality, the prohibition of the relevant advertisements should be enforced preferentially to mitigate the existing anxiety.

Apart from compulsory regulations, the government should simultaneously promote self-regulation of the institutions for the market to be self-correcting and self-adjusting [2]. The central government should cooperate with the local government to establish a circuit breaker mechanism to ensure proactive self-regulation of the institutions. In particular, positively self-regulating institutions should be rewarded with fiscal benefits including a reduction in corporate tax rates; while those responding negatively should be dealt with punitive measures, for instance, compulsory rectification and license disqualification. By establishing that, the government could reform the market and preserves its autonomy, therefore assisting to secure consumer confidence in the market [23].

4.3.2. Increase Investment in Public Services

To further standardize the operation of supplementary education, the government could enter

the market themselves by supplying public supplementary services to the normal in-school teachings. General improvement in public services could disperse the demand from supplementary education services supplied by private institutions towards that of the government sectors. The experiences from South Korea have proven the practicability of this supply-oriented project. The implementation of the After School Education Program in South Korea provides an alternative to supplementary education for parents and students [24]. The program is a government funding project that aims to provide supplementary services using after-school time for students from public schools. Relative to services rendered by private institutions that charge high fees but do not guarantee the quality of the services, the After School Education Program is known for its cost-effectiveness, where low fees are charged, and high-quality resources are available in the program. The high attractiveness of the program causes the backflow of students from supplementary education to public schools [24], thereby transforming the market from private to command.

The success of the After School Education Program in South Korea possesses a high reference level to the Chinese government in administering the market. Similar services regarding childcare, trusteeship, academic tutoring, quality education and entertainment, etc. should be provided in public school after classes. Taken place in public schools, the program could guarantee the students' personal security as well as to take the advantage of the well-maintained facilities in schools, which enables a greater variety of activities available, this deeply corresponds with the government appeal for all-round development of students.

If similar programs are approved to operate in China, then the fees charged for the provision of such services should be much lower than the average expenditure in private institutions to make it price attractive. For instance, table 4 illustrates that it costs 5,616 yuan on average for students to attend courses in private institutions per year, then it is recommended that the program should be made free or charge no more than 1,000 yuan per year to make it affordable for students from economically disadvantaged families. The low prices originates from the control over the cost of management. Since in-school services do not have to concern the cost of land and labour as these are the already existing fixed costs in the school operations, therefore the marginal cost of providing an additional unit of service for a student will be considerably low, which is much more cost-competitive than institutions.

From the perspective of equity, the program aims to provide an equitable distribution of high-quality resources. Following the national syllabus, the public schools are comparatively non-biased, the indifference of privileges of students' family background makes the

access to the resources fair for all students. In addition, the program's settlement in public schools enables government monitoring to ensure the achievement of equity. A report from MOE has shown that 77.43 million students have participated in after-school programs with an overall attendance rate of 85% [25]. This marks the government's ambition to compete with the private institutions, but investments is needed to make it more competitive and dominating. More personalized services should be designed for students and more comprehensive facilities should be established.

Ultimately, these extra curriculum activities not only have the potential to be a better substitute to traditional institutions, but could also mitigate the existence of anxiety among parents, and hence it is an optimal resolution to the dilemma situation in the market.

5. CONCLUSION

To reiterate, the 2021 Burden Alleviation Policy creates dramatic disorder in the supplementary education market, in which the major institutions face huge losses in their stock prices. The market is diminishing, despite consistent demand, and the growth of quality education has dominated the market in the predictable future. The existing firms have to transform their services to avoid further losses, which includes the transformation from academic to interest-oriented courses, from student to career-centered, and from offline to online. These measures could effectively ensure the survival of the firms in the longer term. For the government, it should establish a comprehensive regulatory system to constantly monitor the market, and to increase investment in public services to provide after-school programs in the long run to command the market development. The aforementioned trends, despite being theoretically valid, should be adjusted accordingly to particular circumstances when practiced as there still exist uncertainties in the market.

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